2020 Online HYSPLIT Workshop Agenda
Monday, June 22 - Thursday, June 25

General Considerations and Expectations

1. Each participant will have registered for the Workshop. Information on connecting to the live session will be sent to them via email.
2. Each participant has downloaded the training materials (Tutorial.zip) and unzipped them.
3. Each participant has already installed the model and is working on a PC or Mac (i.e., the user has completed sections 1 and 2 of the Tutorial)
4. Each day's session will be recorded. Processing of each day's video will take significant time (~8 hours or more) but will be posted as soon as possible after the session ends. Participants will have the ability to view the recordings at a time that is convenient for them.
5. Participants will be able to submit questions, and the workshop organizers will attempt to address all questions that are raised.
6. Due to time constraints, some of the topics may not be covered during the workshop. The instructor will prioritize topics based upon the interests of the participants.
7. Information and Updates regarding the event are posted at the Workshop Web Page

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(Note: all times (Eastern Daylight Time EDT) are approximate and some sections may be skipped)

Day 1: Monday, June 22, 2020

8:30 – 8:45 **Introductions and logistics**

Ariel Stein, Deputy Director, NOAA Air Resources Laboratory (ARL)

Mark Cohen, Lead Scientist, Atmospheric Transport and Dispersion (ARL)

Roland Draxler: Course Instructor (ARL) (retired)

8:45 - 9:30 **1 - Installing HYSPLIT**

1. Windows PC
2. Apple MAC OSX
3. UNIX or LINUX (briefly)
4. HYSPLIT directories
5. Exercise #1

9:30 - 10:15 **2 - Testing the installation**

1. Graphical User Interface operation
2. Test trajectory calculation
3. Test air concentration calculation
4. Batch file scripting
5. Using CAPTEX data in this tutorial
6. Exercise #2

10:15 - 10:30 Break

10:30 – 11:15 **3 - Gridded Meteorological Data Files**

1. Tutorial meteorological data
2. FTP meteorological data
3. Convert meteorological data
4. Meteorological data servers
5. User entered meteorological data
6. Exercise #3

11:15 – 12:00 **4 - Trajectory calculations**

1. The trajectory calculation
2. The trajectory equation
3. Estimating mixed layer depths
4. Mixed layer trajectories

12:00 – 1:00 Lunch Break

1:00 – 1:45 **4 - Trajectory calculations (Continued)**

5. Computational trajectory error
6. Meteorology trajectory error
7. Absolute trajectory error
8. Exercise #4

1:45 – 3:00 **5 - Trajectory options**

1. Trajectory vertical motion
2. Trajectory flow field
3. Trajectories and terrain
4. Multiple trajectories time
5. Multiple trajectories in space
6. Meteorological grid ensemble
7. Exercise #5

3:00 - 3:15 Break

3:15 – 4:20 **6 - Trajectory statistics**

1. Frequency analysis
2. Cluster analysis
3. Clustering equations
4. Source geolocation
5. Exercise #5
6. Working directory cleanup

4:20 – 4:30 **Wrap-up**

Day 2: Tuesday, June 23, 2020

8:30 – 8:45 **Comments/questions from the previous day**

8:45 – 10:15 **7 - Air Concentration Calculations**

1. Reconfiguring the test case
2. Air concentration equations
3. Single-particle trajectory
4. Single-particle animation
5. Releasing multiple particles
6. Display particle positions
7. Particle distributions using puffs
8. Downwind puff splitting
9. Exercise #7

10:15 – 10:30 Break

10:30 – 11:30 **8 – Configuring the CAPTEX simulation**

1. Configure for CAPTEX release #2
2. Air concentration display options

11:30 – 12:30 Lunch Break

12:30 – 1:00 **8 – Configuring the CAPTEX simulation (Continued)**

3. Air concentration utilities
4. Air concentration statistics
5. Test and optimize HYSPLIT inputs
6. Simultaneous multiple grids
7. Exercise #8

1:00 – 2:30 **9 – Air Concentration Parameter Sensitivity**

1. Case study base configuration
2. Base configuration optimization
3. Turbulence parameterizations
4. Stability computation method
5. Mixed layer depth calculation
6. Turbulent kinetic energy
7. Dispersion computation method
8. Exercise #9

2:30 – 2:45 Break

2:45 – 3:30 **10 – Alternate display options**

1. Display scripting
2. County map boundaries
3. Enhancing graphic labels
4. Creating KML/KMZ for Google Earth
5. Creating HYSPLIT shapefiles
6. Shapefile overlays
7. Python display options
8. Exercise #10

3:30 – 4:20 **11 – Pollutant transformations and deposition**

(start this section if time permits)

4:20 – 4:30 **Wrap-up**

Day 3: Wednesday, June 24, 2020

8:30 – 8:45 **Comments/questions from the previous day**

8:45 – 10:15 **11 - Pollutant transformations and deposition**

1. Linear mass conversions
2. Dry deposition for gases
3. Dry deposition for particles
4. Wet deposition for gases
5. Wet deposition for particles

6. Exercise #11

10:15 – 10:30 Break

10:30 – 12:00 **12 - Air Concentration Uncertainty**

1. Meteorological grid ensemble
2. Turbulence ensemble
3. Physics ensemble
4. Multiple meteorological data
5. Ensemble verification
6. Ensemble reduction techniques
7. Exercise #12

12:00 – 1:00 Lunch Break

1:00 – 3:00 **13 - Source attribution methods**

1. Counting particle trajectories
2. Emissions from a known location
3. Backward versus forward dispersion
4. Simulations from multiple samplers
5. Source-receptor matrix approach
6. Source location statistics
7. Solving the coefficient matrix (CM)
8. Cost function minimization of the CM
9. Exercise #13

3:00 – 3:15 Break

3:15 – 4:20 **14 – Wildfire smoke and dust storms**

1. Fire smoke
2. Dust Storms: Simplified Algorithm
3. Dust Storms: Revised Algorithm
4. Dust Storms: Emissions Factors
5. Exercise #14

4:20 – 4:30 **Wrap-up**

Day 4: Thursday, June 25, 2020

8:30 – 8:45 **Comments/questions from the previous day**

8:45 – 10:05 **15 – Radioactive pollutants and dose**

1. Basic radioactive decay and dose
2. Long-range I-131 from Fukushima NPP
3. Dose Calculations from Fukushima NPP
4. Exercise #15

10:05 – 10:15 **Special Presentation:**

An overview of the HySPLIT applications from NCSR Demokritos

Athanasios Sfetsos, Environmental Research Laboratory
NCSR Demokritos, Agia Paraskevi, Greece

10:15 – 10:30 Break

10:30 – 12:00 **16 – Volcanic eruptions with gravitational settling**

1. Volcanic Eruptions
2. Restarting the model from PARDUMP
3. Assimilation of satellite data
4. Particle size distributions
5. Creating an EMITIMES emissions file
6. Exercise #16

12:00 – 1:00 Lunch Break

1:00 - 2:00 **17 – Custom simulations**

1. Dynamic or Lagrangian sampling
2. Volume or mass mixing ratios
3. Short-range dispersion
4. Polar coordinate concentration grid
5. STILT configuration in HYSPLIT
   (Chris Loughner, NOAA Air Resources Laboratory)
6. Exercise #17

2:00 - 3:00 **Special Presentation:**

STILT Demonstration

Derek Mallia, University of Utah, Salt Lake City, UT, USA

3:00 – 3:15 Break

3:15 – 4:30 **Final questions and course wrap-up**